

et al.'s patent (U.S. Patent No. 5,783,322) refers to determining a difference in voltage, i.e. potential, and detecting a current, **not** measuring impedance. Specifically, the cited passage states "[a]fter the charge operation is started, if the control circuit 12 determines that the state of the battery package 10 is the full-charged state by determining the potential between the positive and negative electrodes of the secondary battery 11 (an arrangement for determining it is not shown in FIG. 2) and by detecting a charging current by using the resistor R0, then the control circuit 12 sets the transistor FET1 to its off-state again and stops the charge." There is no mention of measuring impedance in Nagai et al.'s patent. On the contrary, Nagai et al.'s patent suggests or teaches a circuit to detect "a **potential** of a signal ... (this potential is a potential Va ...) to thereby detect the charge state or the discharge state based on the detected state of the potential Va." Col 5, lines 13-17; col 4, lines 56-59; col 6, lines 26-34; col 6, lines 61-67. Applicant sincerely apologizes for misstating Nagai et al.'s invention and regrets for any confusion that this statement has caused.

2. Claims 1-7 and 24-27 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Nagai et al. After a careful review of Nagai et al. and the claims, it is believed that the rejections are in error and the rejections are, therefore, traversed.

MPEP § 2143.03 provides:

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The claim limitation responsive “to a predetermined condition ... substantially determined by said internal impedance” is not found in the Nagai et al. reference. The Examiner asserts that the circuit of Nagai et al. “is also responsive to the cell internal impedance exceeding a predetermined impedance, wherein such a condition prompts uncoupling of the voltage and preventing overdischarge. (Col. 9 line 40 et seq and col. 16 line 59 et seq).” However, the Examiner appears to be mistaken. The cited passages clearly state that the circuit of Nagai et al. is responsive to changes in output voltage. For example, in a discussion of the control circuit, the patent states “[w]hen the control circuit 12 monitors the change of the **output voltage** in step 219, an impedance of the transistor FET2, for example, may be changed to detect the change of the **voltage** across both ends of the resistor R0 at that time.” Nagai et al., col. 9, line 40 et seq. Continuing, the passage explains how impedance is related to voltage and current, as is known to a person of ordinary skill in the art. In another example, if the circuit of Nagai et al. determines “that the detected **voltage** is lower than the reference voltage, then ... the control circuit 12 monitors change of the **output voltage** for a predetermined time.” Nagai et al., col. 16, line 59 et seq. In yet more examples, the circuit of Nagai et al. clearly monitors voltage as stated in col 5 line 12 (detection of potential, i.e. differences in voltages); col 6 line 26 (determining potential); col 7 line 27 (voltage detection variations); col 8 line 9 (detect a battery voltage); col 8 line 44 (detects the battery voltage); col 8 line 58 (detects the battery voltage); col 9, line 33 (detected voltage); col 10 line 61 (voltage differences); and col 11 line 49 (detects a voltage V_a). Nowhere is there mention of being responsive “to a predetermined condition ... substantially determined by said internal impedance” as in the claimed invention. Since the claimed invention is drawn to being responsive “to a

predetermined condition ... substantially determined by said internal impedance” and Nagai et al. does not teach or suggest this particular limitation, a prima facie case for unpatentability has not been made. Since a prima facie case of obviousness under MPEP 2143.03 has not been made, the rejection is believed to be improper and should be withdrawn.

3. Claims 8-11 have been rejected as being unpatentable over Nagai et al. in view of Stewart (U.S. Patent No. 5,422,558). The Examiner asserts that “it would have been obvious to one of ordinary skill in the art to modify Nagai et al.’s invention by employing pressure, [H], or temperature as indicators of a predetermined condition for reasons such as early detection of adverse battery conditions.” Upon reviewing Nagai et al. and Stewart, it is believed that the Examiner is in error.

As discussed above, Nagai et al. teaches a circuit that is responsive to changes in output voltage. Therefore, it is clearly different than the claimed invention. Applicant’s invention comprises the claim limitation of “a circuit responsive to a predetermined condition ... substantially determined by said internal impedance.” As mentioned above, this claim limitation is not taught or suggested by the Nagai et al. reference. Further, Stewart also does not contain the claim limitation of “a circuit responsive to a predetermined condition ... substantially determined by said internal impedance.” As the Examiner has noted, ‘Stewart teaches “a battery monitoring sensor 42 for monitoring the power output and status of [an] associated battery 30 for later diagnostic purposes.” Stewart, col. 4, lines 26-39. There is no suggestion or motivation in the Stewart reference to modify the sensor to “uncouple the controller when the required voltage exceeds the battery” as mentioned in the Nagai et al. reference. Nagai et al., col. 4, lines 26-55.’

Office Action dated 10/02/01. Nowhere in Stewart is there mention of the claim limitation of “a circuit responsive to a predetermined condition ... substantially determined by said internal impedance.”

Neither Nagai et al. nor Stewart teach or suggest the claim limitation of “a circuit responsive to a predetermined condition ... substantially determined by said internal impedance.” Since neither Nagai et al. nor Stewart teach or suggest this claim limitation, the combination of Nagai et al. and Stewart also fails to teach or suggest the claimed invention. As required by MPEP 2143.03, if a claim limitation is not taught or suggested, the combination fails to make a prima facie case of obviousness. Since a prima facie case has not been made, the rejection is believed to be improper and should be withdrawn.

4. Claims 12, 14, 28, and 29 have been rejected as being unpatentable over Stewart in view of Shambaugh et al. (U.S. Patent No. 4,418,127). The Examiner asserts “at the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Stewart’s invention by employing the instant housing configuration for reasons such as serial connection of the plural battery modules for increased battery capacity and increased operating voltage.” Upon reviewing Stewart, Shambaugh et al., and the claimed invention (as amended), it is believed that that the Examiner is in error.

Claim 12 has been amended to require a multiple-cell battery comprising the claim limitation “substantially determined by said first internal impedance and said second internal impedance.” As mentioned above, this claim limitation is not taught or suggested by the Stewart reference. Further, Shambaugh et al. does not teach or suggest this claim limitation. Shambaugh et al. teaches a modular lithium battery having a

plurality of cells so as to reduce the weight and strengthen the cells of the structure.

Abstract; col. 1, lines 37-40. Since neither Stewart nor Shambaugh et al. teach or suggest the claimed limitation, the combination also fails to teach or suggest the claimed invention and, therefore, a prima facie case of obviousness has not been made. Since a prima facie case has not been made, the rejection is believed to be improper and should be withdrawn.

5. Claims 15-22 have been rejected as being unpatentable over Stewart in view of Shambaugh et al. Since claims 15-22 are dependent upon claim 12 and since claim 12 has been shown to be allowable over Stewart in view of Shambaugh et al., then so too are the dependent claims.

6. The allowance of Claims 1-12, 14-22, and 24-29 is believed to be in order and such action is earnestly solicited. Should the Examiner be of the opinion that a telephone conference would expedite prosecution of the subject application, he is respectfully requested to telephone applicant's undersigned attorney.

Respectfully submitted,

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MARKED-UP VERSION OF AMENDED CLAIMS

A marked-up version of amended claims is presented herewith in accordance with 37 CFR 1.121(c)(1)(ii).

12. A multiple-cell battery comprising:

- a first container having a positive terminal and a negative terminal;
- a first battery cell having a first internal impedance disposed within said first container, said first battery cell having a positive electrode, a negative electrode, and a battery cell voltage measured across said positive and said negative electrodes of the first battery cell;

- a first controller electrically coupled between the electrodes of said first battery cell and the terminals of said first container to create a first container output voltage measured across said first container positive and negative terminals;

- a second container electrically coupled to said first container, said second container having a positive terminal and a negative terminal, wherein said positive terminal of said second container is connected to said negative terminal of said first container;

- a second battery cell having a second internal impedance disposed within said second container, said second battery cell having a positive electrode, a negative electrode, and a battery cell voltage measured across said positive and said negative electrodes of the second battery cell;

- a second controller electrically coupled between said electrodes of said second battery cell and said terminals of said second container to create a second container output voltage measured across said container positive and negative terminals; and

- a circuit responsive to a predetermined condition of said multiple cell battery substantially determined by said first internal impedance and said second internal impedance, the circuit being electrically coupled to one of the first and second controllers to uncouple the respective one of the first and second container output voltages from the terminals of the respective one of the first and second containers upon detection of said predetermined condition.

CLEAN VERSION OF AMENDED CLAIMS

A clean version of amended claims is presented herewith in accordance with 37 CFR 1.121(c)(1)(i).

12. A multiple-cell battery comprising:

- a first container having a positive terminal and a negative terminal;

- a first battery cell having a first internal impedance disposed within said first container, said first battery cell having a positive electrode, a negative electrode, and a battery cell voltage measured across said positive and said negative electrodes of the first battery cell;

- a first controller electrically coupled between the electrodes of said first battery cell and the terminals of said first container to create a first container output voltage measured across said first container positive and negative terminals;

- a second container electrically coupled to said first container, said second container having a positive terminal and a negative terminal, wherein said positive terminal of said second container is connected to said negative terminal of said first container;

- a second battery cell having a second internal impedance disposed within said second container, said second battery cell having a positive electrode, a negative electrode, and a battery cell voltage measured across said positive and said negative electrodes of the second battery cell;

- a second controller electrically coupled between said electrodes of said second battery cell and said terminals of said second container to create a second container output voltage measured across said container positive and negative terminals; and

- a circuit responsive to a predetermined condition of said multiple cell battery substantially determined by said first internal impedance and said second internal impedance, the circuit being electrically coupled to one of the first and second controllers to uncouple the respective one of the first and second container output voltages from the terminals of the respective one of the first and second containers upon detection of said predetermined condition.